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PROPOSED FINAL
BAY AREA
'94 CLEAN AIR PLAN

Volume II

APPENDIX F
Transportation Control Measure
Descriptions



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TCM 1 - EXPAND EMPLOYER ASSISTANCE PROGRAMS

Purpose

This TCM will expand and enhance programs to provide public sector support for employer-based trip reduction programs. These efforts are important, both to support employers which are already implementing trip reduction programs, and to assist employers subject to employer-based trip reduction rules, as described in TCM 2.

Background

Employer-based trip reduction is required under TCM 2. Many employer initiatives are being tested within the region and around the State. It is important that public agencies assist in complying with these requirements.

This TCM will help to monitor the effectiveness of various trip reduction measures, to promote the exchange of information among employers, and to stimulate innovative programs.

Description

A sustained employer effort is an integral part of a successful TCM plan. This measure provides new ways to support ongoing efforts by establishing, through the public sector, additional programs and sources of information for use by employers.

TCM 1 includes the following activities and programs:

- RIDES and other organizations certified by BAAQMD will provide training for Employer Transportation Coordinators.
- Identify highly effective programs and companies which can act as "pacesetters" or models for employers elsewhere. (Federal TCM 23).
- Provide assistance in establishing transportation management associations, particularly those oriented toward the needs of smaller employers.
- RIDES or another entity will provide an expanded training and education program through workshops for employer program managers and city and county TSM coordinators.
- RIDES or another entity will assist trip reduction efforts at major employers by providing on-site consultations and informational mailings, supporting company vanpool programs, and promoting sales of transit tickets (see TCM 14).
- Provide information to employers for establishing telecommuting programs (see also TCM 17).

Travel Market Affected

This measure primarily addresses commute travel between home and work, which accounts for 25% of vehicle trips, 33% of vehicle miles traveled and 27% of mobile emissions in the Bay Area. In addition to commute trips, TCM 1 may also help to reduce other work-related vehicle trips, such as lunch hour errands.

Effectiveness

TCM 1 is expected to yield the following emission reductions, beginning in Phase 1:

<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
0.18%	0.18%	0.17%

TCM 1 may indirectly promote additional reductions by providing information and experience that can be used in developing effective trip reduction programs at new locations.

Cost

The major costs associated with TCM 1 are additional funding for RIDES or other entities to expand their employer assistance programs.

Implementation

Implementation of TCM 1 will require cooperation between MTC, regional ridesharing agencies, Congestion Management Agencies, city and county TSM managers, employer associations, etc. The primary role of MTC and the Air District will be to encourage and coordinate the many initiatives and programs that are either underway or planned around the region. Caltrans has funded ridesharing programs throughout the state over the past several years, and is expected to continue to provide support in future years. Additional funding may be available through AB 434.

Impediments

The main issue may be assuring efficient coordination of effort between the public and private sectors, and promoting cooperation among public sector agencies.

Other Impacts

In addition to reducing emissions, TCM 1 will reduce vehicle trips and vehicle miles traveled. TCM 1 is expected to provide travel time benefits valued at \$6 million per year, far in excess of estimated implementation costs. Other impacts include reduced fuel consumption, reduced wear and tear on motor vehicles and the regional road network, reduced carbon dioxide emissions (CO₂), and reduced water pollution.

TCM 2 - EMPLOYER-BASED TRIP REDUCTION

Purpose

The purpose of TCM 2 is to decrease motor vehicle emissions by reducing the use of single occupant vehicles for commuting to work sites and employment centers in the Bay Area.

Background

Although Bay Area cities and counties began to adopt trip reduction ordinances to mitigate local traffic congestion in the mid-1980's, the California Clean Air Act created a specific link between employer-based trip reduction and air quality. The Act required air districts to adopt "reasonably available transportation control measures" as a necessary component of their control strategy to attain State ambient air quality standards. The Air Resources Board determined that employer-based trip reduction rules are a reasonably available transportation control measure. The California Clean Air Act also established several transportation performance standards. As a "serious" ozone non-attainment area, the Bay Area is required to implement measures to achieve an average of 1.4 or more persons per passenger vehicle during weekday commute hours by 1999. In response to these mandates, the Bay Area Air Quality Management District (BAAQMD) adopted Regulation 13, Rule 1, Trip Reduction Requirements for Large Employers (the rule) in December 1992.

Description

Regulation 13, Rule 1 applies to all employers at work sites with 100 or more employees. The rule divides the region into four geographic zones and establishes annual performance objectives for each zone. The performance objectives are expressed in terms of Vehicle Employee Ratio (VER). [Note: VER is the reciprocal of average vehicle ridership (AVR).] The performance objectives are phased; interim VER objectives are established for years 1993-1997, with final objectives effective in 1998. Failure to achieve the performance objectives is not a violation of the rule; it does trigger the requirement to submit an employer trip reduction plan.

The rule includes a provision that allows local jurisdictions (e.g. a city) to demonstrate that the final VER performance objectives are achieved on an aggregate basis for all applicable work sites within the jurisdiction. Work sites in such jurisdictions are not subject to the specific rule requirements. The City and County of San Francisco has made such a demonstration.

The rule establishes the following administrative requirements: employer registration; designation of an Employee Transportation Coordinator (ETC) and an Employer Program Manager; employee notification; annual employee transportation survey; and development and implementation of an Employer Trip Reduction Program. In addition, employers that do not achieve the applicable performance objective are required to submit an Employer Trip Reduction Plan for review and approval. Employers have the option of submitting a conventional Employer Trip Reduction Plan or an Alternative Emission Reduction Program. The conventional Plan includes trip reduction measures to reduce the number of employees commuting to the work site

in single occupant vehicles. An Alternative Emission Reduction Program achieves emission reductions through other means, such as a vehicle buy-back or scrappage program.

In addition to implementing the rule, the BAAQMD will work to reduce commute trips to smaller work sites and employment centers that are not subject to Regulation 13, Rule 1. The District will pursue this via informational and outreach efforts directed toward smaller employers and employment centers (i.e. multi-tenant facilities). The District will also allocate AB 434 funds (the Transportation Fund for Clean Air), as appropriate, to projects and programs that benefit trip reduction efforts at smaller work sites. Current State law (SB 883) prohibits air districts from requiring employers of less than 100 employees to submit trip reduction plans. This law sunsets in 1997. The BAAQMD will develop Regulation 13, Rule 2 to address employment centers and smaller employers in these centers in 1998.

Travel Market Affected

TCM 2 focuses on commute travel, in particular commute travel during the morning and evening peak periods. On an average weekday, commute travel accounts for 25% of total vehicle trips, 33% of vehicle miles traveled, and 27% of on-road mobile source emissions in the Bay Area.

Implementation

Regulation 13, Rule 1 became effective July 1, 1993 in Marin and Napa Counties. The rule became effective in other counties within the BAAQMD on July 1, 1994. The BAAQMD is implementing the rule, except in those areas where a local jurisdiction implements the rule via a delegation agreement with the BAAQMD. As of April 1994, a total of 25 local jurisdictions expressed intent to seek delegation of the rule. This includes all jurisdictions in Contra Costa County, as well as the cities of Alameda, Emeryville, and Pleasanton in Alameda County, San Francisco International Airport, the City of Fairfield, and Solano County (for work sites located in the unincorporated area of the county).

Effectiveness

Achievement of the final performance objectives in the rule would raise the aggregate average vehicle ridership for all work sites subject to the rule from 1.3 to 1.43. This would decrease vehicle trips to affected work sites by 10 percent, eliminating approximately 168,000 vehicle trips per day. The rule is estimated to reduce the on-road mobile source emissions inventory by 1%. This will provide emission reductions of 1.6 tons per day of ROG, 1.7 tons per day of NO_x, and 11.9 tons per days of CO, based on the 1999 on-road vehicle emissions inventory. No emission reduction estimate is available for proposed efforts to reduce vehicle trips to smaller employers at employment centers.

Cost

Costs to employers include administrative costs (salary and overhead for the ETC, survey processing, etc.) as well as the costs of services and incentives provided by the employer trip reduction program. Employer costs will vary, depending upon geographic location, proximity to

transportation alternatives, the type of business and work force, and the measures that the employer chooses to include in its trip reduction program. Estimates of costs to comply with trip reduction requirements vary considerably. Data from southern California and Pima County, Arizona indicate that employers are spending between \$12 and \$86 per employee per year to comply with trip reduction regulations, with a median cost of \$70 per employee per year. Employers are eligible for various State tax credits and deductions for trip reduction measures, which can help to offset the costs of their trip reduction programs. Some employers may choose to fund their programs by imposing parking fees at the work site.

Other Impacts

In addition to reducing motor vehicle emissions, TCM 2 will help to reduce peak period traffic congestion and fuel consumption. Reducing vehicle trips will also decrease emissions of air toxics, carbon dioxide emissions (i.e. global warming), water pollution, and noise pollution.

Employees at affected work sites should benefit from enhanced commute options. Employees who switch from driving alone to a commute alternative will save money on fuel, vehicle depreciation and maintenance, tolls and parking, etc. They will also benefit from decreased stress associated with driving in traffic. Employers also will realize benefits from trip reduction programs, including increased employee productivity, reduced absenteeism, longer retention of employees, and reduced demand for parking at the work site.

The rule will promote the implementation of alternative work arrangements, such as telecommuting and compressed work week schedules. Additionally, the rule will encourage employers to consider access to transit and other commute alternatives in locational decisions.

TCM 3 - IMPROVE AREAWIDE TRANSIT SERVICE

Purpose

This TCM will help to reduce motor vehicle trips, vehicle miles traveled, and mobile source emissions by maintaining existing transit service and improving service to the extent that new revenues are available.

Background

The overall goal of the TCM plan is to reduce vehicle trips, vehicle miles traveled, and vehicle idling. One key strategy is to increase trips taken on transit. Therefore, viable transportation alternatives to the private automobile must be provided. The centerpiece of the TCM plan is a package of mobility measures, which includes all or part of TCMs 3 through 15. TCM 3 supports maintenance and improvement of the region's transit service. MTC's *Regional Transportation Plan (RTP)* projects that by maintaining bus systems and implementing a number of rail extensions, average weekday transit boardings will increase by 18 percent to 1.9 million by 2010.

Description

TCM 3 includes the following elements:

Phase 1 (1994 - 1997)

- continue post-earthquake expansion of BART service (Federal TCM 17);
- expand CalTrain service from 60 to 66 trains per day (Federal TCM 19);
- encourage transit operators to convert bus fleets to clean fuel vehicles;
- maintain existing transit services defined in MTC's *Regional Transportation Plan* and *Transportation Improvement Program* through securing adequate funds for operations and maintenance/rehabilitation.
- improve transit access to airports.

Phase 2 (Beyond 1997)

- increase local bus service as revenues become available.
- implement long-term transit improvements defined in MTC's *Regional Transportation Plan* in order to achieve 2010 transit ridership levels shown in the RTP.

Travel Market Affected

This measure should affect all intra-regional travel, including commute travel, shopping, personal business, social and recreational travel, and school trips.

Effectiveness

TCM 3 supports the transit program outlined in MTC's 1994 *Regional Transportation Plan* (RTP). As shown in the RTP, most of the region's resources over the next 20 years are expected to be utilized in maintaining and replacing existing capital resources. Little or no expansion of bus systems is expected before the year 2000, and there are no new funds on the horizon for transit operations, therefore, the estimated emission impact of rail expansion programs are shown under TCM 4, TCM 5 and TCM 6. While TCM 3 is critical to **maintaining** air quality, no additional air quality emission reductions are assumed until new transit operating revenues are identified.

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.0%	0.0%	0.0%
Phase 2	0.0%	0.0%	0.0%

The cost to maintain transit systems over the next 20 years is estimated at \$7.3 billion in capital replacement needs and \$34.6 billion in operating funding needs.

Implementation

Implementation of TCM 3 requires cooperation between MTC, all transit operators in the region, county Congestion Management Agencies and funding agencies such as FHWA/FTA and Caltrans. MTC programs funds in the *Transportation Improvement Program* and related programming documents and approves funding applications for transit projects. Expansion of CalTrain service to 66 trains will require funding commitments from the JPB partners.

Impediments

Implementation of TCM 3 will require that existing sources of transit funding be maintained consistent with assumptions in MTC's *Regional Transportation Plan*. As noted above, expansion of service requires new operating funds, which are currently not available. Expansion of CalTrain service will require cooperation and funding from Santa Clara, San Mateo and San Francisco Counties.

Other Impacts

Other benefits include reduced need for additional road capacity, savings on wear and tear on both roadways and motor vehicles, and improved quality of life for Bay Area residents due to improved transportation options. TCM 3 will have an overall net benefit in terms of air quality.

TCM 4 - EXPEDITE AND EXPAND REGIONAL RAIL AGREEMENT

Purpose

This TCM will reduce motor vehicle trips, vehicle miles traveled and mobile source emissions by promoting rail extensions on the BART, Tasman light rail and CalTrain systems.

Background

In order to reduce motor vehicle travel and mobile emissions, it is necessary to provide Bay Area residents with viable transportation alternatives to the private automobile. TCM 4 is a mobility improvement measure, spanning both phases of the TCM plan. This measure is based upon the *Regional Transportation Plan* and MTC's New Rail Starts Program, as outlined in MTC Resolution 1876.

TCM 4 will be of particular benefit to fast-growing areas of the region which are currently poorly served by public transportation, including Contra Costa County and southeastern Alameda County. It will also help to reduce congestion on the heavily traveled Highway 101 corridor on the Peninsula and vehicle trips to San Francisco International Airport.

Description

Phase 1 (1994 to 1997)

- BART extension from Daly City to Colma (Federal TCM 16)
- BART to Dublin
- BART to West Pittsburg (2 station extension)

Phase 2 (beyond 1997)

- Extension of :
 - BART to San Francisco International Airport (4 or 5 stations)
 - Fremont-South Bay rail connection
- Extension of CalTrain to downtown in San Francisco
- Extension of Tasman light rail system in Santa Clara: 12 miles, 19 stations
- Further extension of regional rail systems, dependent upon demand and funding

Travel Market Affected

This measure would affect all types of intra-regional travel, including commute travel, shopping, personal business, social and recreational trips, school trips, and travel to San Francisco International Airport.

Effectiveness

TCM 4 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.49%	0.43%	0.49%
Phase 2	0.37%	0.33%	0.37%
Total	0.86%	0.76%	0.86%

The effectiveness of TCM 4 in reducing vehicle travel and emissions depends in part upon market-based pricing and success in developing land use policies that complement transit, such as zoning policies that encourage denser development in the vicinity of transit stations (see TCM 15).

Cost

Approximately 80 percent of the funding for Phases 1 and 2 is available through existing funding sources. If legislation is approved for TCM 18 revenue measures, a portion of this additional revenue could be used to accelerate construction of the rail extensions in Phase 2.

Implementation

MTC is working with BART, CalTrain and Santa Clara County Transit to implement the New Rail Starts program. Funding for the New Rail Starts program is based upon a combination of Federal aid, State funding, and local sales tax revenues. Federal funding for the extension to San Francisco International Airport and San Mateo County "buy-in" is critical to the financing plan for the entire package of BART extensions.

The current schedule calls for completion of the BART extension to Dublin and Colma in 1995, to West Pittsburg in 1997, and to San Francisco International Airport (SFO) in 2002. (Earlier implementation may be possible depending upon the extension's financial plan.) The Tasman Light Rail project is scheduled for completion in 1997 if the Santa Clara County sales tax measure is upheld.

The CalTrain extension to downtown San Francisco is being studied as part of a Federal Environmental Impact Statement and may be implemented as early as 1998 depending upon development of a financing plan.

Impediments

Obtaining federal "Full Funding Agreements" are critical for BART to SFO and the Tasman projects. Acceleration of the construction schedule is contingent upon obtaining federal and local funding. Full funding for the Fremont-South Bay rail connection is not yet identified.

Other Impacts

In addition to reducing emissions, TCM 4 is expected to yield \$44 million per year in travel time savings by reducing traffic congestion. Other benefits include reduced need for additional road capacity, reduced wear and tear on both roadways and motor vehicles, and improved quality of life for Bay Area residents due to improved transportation options.

Although TCM 4 will improve the region's overall air quality, it may have negative impacts on a localized basis. Emissions due to construction may cause a short-term negative impact on air quality. Also, motor vehicle trips to the new transit stations may increase local carbon monoxide levels in some areas. Mitigation of the latter impact can be achieved through measures that promote the use of walking, bicycling, and shuttle buses to access transit stations.

TCM 5 - IMPROVE ACCESS TO RAIL AND FERRIES

Purpose

TCM 5 will reduce motor vehicle trips and vehicle miles traveled by improving access to rail and ferry systems. This measure will complement TCMs 3, 4, 6 and 7.

Background

The Bay Area is committed to maintaining and improving transit service at an eventual cost of several billion dollars. Supporting measures that promote access to transit are needed to ensure that the region gets full return on this large investment.

From the standpoint of air quality, it is critical to reduce motor vehicle trips. Because of the "cold start" effect, much of the potential air quality benefit is lost if transit patrons drive to the station. For this reason, emphasis should be placed on access improvements that promote alternatives to the automobile, wherever this approach is feasible.

Description

TCM 5 provides for significant improvements in rail and ferry access through the following strategies:

- support improved local and express feeder bus services to rail and ferries consistent with Short Range Transit Plans
- improve bicycle access (e.g. bike paths, adequate curb lane widths for bicycles on roadways, storage facilities)
- develop private shuttles to employment centers
- encourage BART and CalTrain to provide preferential parking for electric vehicles

Travel Market Affected

TCM 5 will affect all types of trips, including commute travel, shopping, personal business, social and recreational travel, and school trips.

Effectiveness

TCM 5 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1 (1994 to 1997)	0.02%	0.02%	0.03%
Phase 2 (beyond 1997)	0.30%	0.30%	0.25%
Total	0.32%	0.32%	0.28%

Cost

Total cost in 1991 was estimated at \$50 million per year to subsidize services that provide improved timed-transfer access to mass transit. However, as noted in TCM 3, funding for additional and improved operating costs are currently not available.

Implementation

Implementation of TCM 5 will require cooperation between MTC, bus and rail operators, and the private sector (employers, developers, etc.).

MTC will allocate funds under its control consistent with the *Regional Transportation Plan* and operator Short Range Transit Plans. AB 434 funds are available for local feeder bus or shuttle service.

The San Francisco Bay Area Ferry Plan prepared for the City of Vallejo and MTC contains recommendations for improving feeder bus service to ferries.

RIDES or another entity will be funded to work with transit operators and employers to establish private shuttle service for interested major employers.

CalTrain has an existing program to work with employers in setting up shuttles to employment sites that are located near CalTrain stations.

Impediments

Full implementation of TCM 5 will require approval of legislation to provide revenue (see TCM 18).

Other Impacts

In addition to reducing emissions, TCM 5 benefits include reduced fuel consumption, reduced wear and tear on motor vehicles and roadways, and enhanced transportation options for residents of the Bay Area.

Although TCM 5 will improve the region's overall air quality, it may have negative impacts on a localized basis. There are potential impacts due to an increase in vehicle trips from expanded feeder and shuttle bus service at transit stations. Potential impacts would be mitigated by promoting the use of low emission buses and by emphasizing access improvements that promote alternatives to the private automobile. Increased bus traffic around rail and ferry stations should be completely offset by a reduction in single occupant vehicles.

TCM 6 - IMPROVE INTERCITY RAIL SERVICE

Purpose

TCM 6 will reduce motor vehicle travel and mobile source emissions by providing regular intercity rail service in the Auburn-Sacramento-Oakland-San Jose corridor.

Background

The I-80 corridor between the Bay Area and Sacramento is one of the most heavily traveled and fastest growing corridors in northern California. Existing AmTrak service between Oakland and Sacramento is limited to three daily round trips per day and the hours of service are inconvenient. This measure will provide an alternative transportation service in the corridor.

Description

Implement new intercity rail service in the Auburn-Sacramento-San Jose corridor as defined in the ACR 132 (Hannigan) Rail Study -- target is 6 round trips in 1995/96 and 10 round trips per day by 1999/2000.

Phase 1 (1994 to 1997) of TCM 6 incorporates Federal TCM 18 (3 round trips/day).

Travel Market Affected

TCM 6 will affect both interregional travel, between the Bay Area and the Sacramento area, and intra-regional travel, primarily in the I-80, I-680 and I-880 corridors. Full implementation of this measure will provide viable service during commute periods.

Effectiveness

TCM 6 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.05%	0.05%	0.04%
Phase 2	0.02%	0.02%	0.01%
Total	<u>0.07%</u>	<u>0.07%</u>	<u>0.05%</u>

Cost

Funding for capital costs to initiate service and upgrade it to 6 daily round trips is committed. Funding to sustain the operation of current service and provide for additional service must be secured. (see below). Legislation to generate revenues for the mobility improvements would assist in meeting potential shortfalls operating and maintenance costs anticipated through the remainder of the 1990's.

Implementation

Implementation of new rail service in the Auburn-Sacramento-San Jose corridor is based upon the ACR 132 (Hannigan) Rail Corridor Upgrade Study which was completed in December 1990.

Propositions 108 and 116 provide capital funding for this rail corridor. Agreements have been reached which will make it possible to operate 6 trains per day.

Additional capital funds must be secured to accomplish a higher level of service in the corridor (10 or more round trips per day). Operating costs of the current service (3 daily round trips) are approximately \$8 million annually. In 1993, approximately 38% of these costs were covered by fares, the remainder from State funds. Maintaining service will require continued funding support from both fares and state subsidy.

Initial service with three round trips per day began in early 1992. Service will increase in subsequent years according to the following timetable:

Phase I - Stage 2 (FY 1995) - 6 round trips

Phase II - Stage 3 (FY 1999-2000) - 10 round trips

Impediments

Obstacles to maintaining current service levels and adding additional trains include (1) the possibility that a State-mandated annual fare box return of 55% after 3 years will not be met, jeopardizing State operating support; (2) a new Amtrak/SP contract in 1996 may increase the cost of operating service in the corridor; and (3) SP right-of-way acquisition issues.

Other Impacts

TCM 6 will provide a much needed transportation alternative in the Sacramento to San Jose corridor. This will help to reduce congestion in the heavily traveled I-80 and I-880 corridors. Travel time savings are estimated at \$2.5 million per year. Additional benefits include reducing fuel consumption, vehicle wear and tear/depreciation, highway maintenance costs, and carbon dioxide emissions.

TCM 7 - IMPROVE FERRY SERVICE

Purpose

TCM 7 will reduce motor vehicle travel and mobile source emissions by expanding trans-Bay ferry service.

Background

Freeways and bridges that connect the East Bay and the North Bay to San Francisco are heavily congested. High speed ferry service offers a transportation alternative that is efficient, comfortable and high in aesthetic appeal.

Description

TCM 7 contains several elements:

- Continuation of post-earthquake ferry service between Oakland/Alameda and San Francisco (Federal TCM 17)
- Expansion of existing service on Vallejo to San Francisco route
- New service between the Richmond and Berkeley areas and San Francisco
- Continuation of service between Harbor Bay Isle (Alameda) and San Francisco (private operator)
- Potential new service between Port Sonoma and San Francisco (private operator)
- Potential new service for passengers and cargo between Oakland and San Francisco airports
- Feeder bus service to provide access to ferries (see also TCM 5)

Travel Market Affected

This measure will focus primarily on peak period commute travel, when congestion on bridges is greatest. It will also provide an additional transportation option for shopping, personal business, and social and recreational trips. Expanded ferry service may also generate tourist trips on midday service.

Effectiveness

TCM 7 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.01%	0.01%	0.01%
Phase 2	0.01%	0.01%	0.01%
Total	0.02%	0.02%	0.02%

Cost

Portions of TCM 7 are already funded (see below). If legislation is approved to provide revenues for the mobility package, additional funding could be allocated to facilitate full implementation of TCM 7.

Implementation

MTC prepared a regional ferry service plan as required by SB 2169 (Kopp) in September 1992. MTC will allocate funds under its control consistent with the long range ferry plan. MTC and the City of Vallejo have commissioned two studies to analyze improvements to existing service as well as opportunities for new service. The first study, which focuses on improvements to existing service, addresses schedules, boats, terminal improvements, feeder service and ridership projections. Ridership is projected to increase from 2.7 million per year to 4 million per year by the mid-1990's.

Funding for continued service between Oakland/Alameda and San Francisco is through bridge tolls allocated by MTC and local funding from the City of Alameda and Port of Oakland.

Proposition 116 and Federal funds will provide \$10 million for improvements to the Vallejo ferry. Programmed improvements include: (1) replacing the one existing vessel with two high speed boats, (2) making improvements to the terminal and the parking facilities in Vallejo, (3) developing the Vallejo terminal as a multi-modal transit center for North Bay. These improvements are scheduled to be implemented in the 1994-1997 period.

A private developer has proposed to initiate high speed ferry service from Port Sonoma (near Novato) to San Francisco; however, funding and other issues will have to be resolved. MTC has worked with ferry and other transit operators to develop transfer arrangements, including low cost transfers and joint passes (see TCM 13).

Impediments

Full implementation of Phase 2 elements (beyond 1997) requires approval of legislation to provide revenues.

State PUC approval is required to initiate new private ferry service.

Other Impacts

By helping to reduce traffic congestion, TCM 7 is expected to reduce fuel consumption, wear and tear on motor vehicles, and highway maintenance costs.

Expansion of ferry service will enhance the Bay Area's transportation system by providing a transportation option that is both practical and high in aesthetic value. A regional ferry system may help to stimulate the tourist industry throughout the region.

TCM 8 - CONSTRUCT CARPOOL / EXPRESS BUS LANES ON FREEWAYS

Purpose

This TCM will help reduce vehicle trips, VMT and mobile source emissions by promoting the use of carpools, vanpools and other high occupancy vehicles (HOVs) such as express buses.

Background

Low vehicle occupancy rates are a major cause of the Bay Area's air pollution and traffic congestion problems. The single occupant vehicle is the dominant mode of transportation, especially during peak commute periods, when over 68% of cars and trucks carry only the driver (Source: 1990 Census). Travel time and cost are the primary factors that influence choice in transportation mode. Although carpools and vanpools can provide a significant cost saving compared to driving alone, they often involve a sacrifice in terms of time required for pick-up and drop-off. By providing a significant time savings for carpools, vanpools and express buses, additional HOV lanes on key freeways and expressways will stimulate formation of carpools and use of high occupancy vehicles.

The California Air Resources Board has defined HOV lane networks as a "reasonably available" transportation control measure under the provisions of the California Clean Air Act.

Description

MTC issued a "Year 2005 HOV Master Plan" in August 1990, which was prepared in cooperation with Caltrans and the California Highway Patrol. This master plan provides the blueprint for construction of additional HOV lanes in the region. The Master Plan calls for a network of 480 lane-miles of HOV lanes upon completion compared to approximately 100 lane-miles at present. This measure includes Federal TCM 20.

Other enhancements to the HOV lane plan need to be developed, such as:

- direct connections between HOV lanes on intersecting freeways
- "slip ramps" allowing direct entry and exit to HOV lanes at key points along freeways
- strategically located park & ride lots for HOV lane users

Increases in certain express bus services should be considered to maximize person carrying capacity of HOV lanes.

Vehicle occupancy needs to be monitored and HOV lane use requirements increased from 2 to 3 people per vehicle if appropriate to maintain travel time advantages.

TCM 8 is a Phase 1 and Phase 2 measure.

Travel Markets Affected

TCM 8 is aimed primarily at commute trips, which account for the majority of trips during the morning and evening peak periods. However, HOV lanes should help to increase average vehicle occupancy for other types of trips (shopping, personal business, school, recreational) that occur during peak periods.

Effectiveness

TCM 8 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.23%	0.22%	0.20%
Phase 2	0.41%	0.40%	0.38%
Total	<u>0.64%</u>	<u>0.62%</u>	<u>0.58%</u>

Costs

Funding for partial construction of the HOV Lane Master Plan is already available through several sources, including Proposition 111. If legislation is approved for new revenue measures (see TCM 18), a portion of this new revenue could be allocated to expedite construction of the HOV lanes during Phase 2.

Implementation

Funding varies by project, and can include Federal, State and local monies. Over \$900 million in Federal and State highway funds are programmed in the 1994 TIP for HOV lanes.

MTC and Caltrans will conduct corridor studies to help determine the need for support facilities described above, such as additional park & ride lots, special entrance and exit ramps for HOV lanes, and express bus service.

MTC will coordinate with Caltrans on specific proposals with respect to their design feasibility and potential for funding.

MTC will seek funds for critical regional express bus service needs which would be operated on HOV lanes, such as in the I-80 corridor.

Impediments

Funding must be maintained as assumed in the *Regional Transportation Plan*.

Other Impacts

In addition to reducing emissions, TCM 8 will help to mitigate traffic congestion. Additional benefits include reduced fuel consumption, reduced wear and tear on motor vehicles, and reduced highway maintenance costs.

Construction of HOV lanes will create substantial employment in the construction trades over the next 10-15 years.

TCM 8 may have a short term negative impact on air quality due to emissions generated during construction. Congestion on freeways and adjacent arterials can be expected during construction. However, Caltrans plans to implement traffic mitigation programs for certain major projects, including the 680/24 project and the I-80 project.

TCM 9 - IMPROVE BICYCLE ACCESS AND FACILITIES

Purpose

TCM 9 will reduce motor vehicle travel and mobile source emissions by promoting the expansion of bicycle facilities such as bike routes and lanes, and by increasing bicycle access to buses, trains, and bridges.

Background

Bicycles are a pollution-free transportation mode, well suited to short and medium range trips. They also provide an excellent means of access to transit stations. Despite these attributes, however, bicycles are poorly served by the existing transportation infrastructure. According to 1990 Census data for the Bay Area, bicycles are the primary transportation mode for 1.1% of commute trips in the region. More recent (1992-1994) commute surveys conducted by RIDES shows that the percentage of bicycle commuters in the region may be approaching 2%, a noteworthy increase in a very short time frame. In certain cities (e.g., Palo Alto, Menlo Park and Berkeley), the percentage of bicycle commuters is much higher.

Experience in cities such as Palo Alto and Davis, as well as in European cities such as Amsterdam, shows that bicycles can play an important role in local transportation. The improvements in access and facilities in TCM 9 should enable bicycles to play a greater role in the overall regional transportation system.

Description

Bicycle improvements in TCM 9 include:

- Expand the system of local and regional bike routes, lanes and paths to serve shopping areas, employment centers, educational and cultural facilities, civic centers, etc.
- Provide adequate curb lane widths for bicycles on roadways
- Permit bicycles on freeway shoulders where no alternative parallel route exists
- Adjust signal equipment and provide pavement marking for detecting bikes
- Expand carrying capability for bikes on buses, ferries and rail systems
- Provide means for bicycles to cross all existing Bay bridges; encourage Caltrans to provide direct access for bicycles on the Benicia-Martinez and Richmond-San Rafael bridges; provide direct access for bicycles on any new or modified bridge construction
- Incorporate bicycle access and facilities into the site design for new developments (see TCM 15)
- Cities and counties can include provision of bicycle amenities in the development approval process

TCM 9 sets a goal of achieving a 3% bicycle commute mode share by 1997, compared to 1.1% in 1990.

Travel Market Affected

TCM 9 will help to promote the use of bicycles (or bicycles combined with transit) for the entire range of intra-regional trips, including commuting, shopping, personal business, and social and recreational travel. Bicycles are especially well suited for short distance trips, including shopping, errands, social visits.

Effectiveness

TCM 9 is expected to yield the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.01%	0.01%	0.01%
Phase 2	0.02%	0.02%	0.03%
Total	0.03%	0.03%	0.04%

Cost

Transportation Development Act (TDA) funds of about \$3 million per year are currently available for bicycle improvements. MTC's *Regional Transportation Plan* includes \$43 million over the next 20 years in new funding for bicycle/pedestrian facilities. If legislation is approved to provide funding for the mobility package, additional funding would be available to fund additional bicycle improvements.

Implementation

Implementation of TCM 9 will require cooperation among BAAQMD, MTC, Caltrans, transit operators, cities and counties, and employers, developers, and property managers.

Approximately \$3 million per year in TDA funds is currently available for region-wide bicycle improvements and \$43 million in STP/CMAQ funds over the next 20 years. MTC requires cities and counties to form and maintain Bicycle Advisory Committees, and to develop comprehensive bicycle plans as a condition for receiving TDA funds.

MTC will encourage transit operators to increase bicycle carrying capability.

MTC will encourage Caltrans to provide means for bicycles to cross all Bay bridges.

TCM 15 encourages local government to require the provision of bicycle facilities at developments such as office parks, shopping centers and residential complexes.

Impediments

Full implementation of bicycle improvements is contingent upon approval of legislation to provide revenues to fund the mobility package (see TCM 18). Increased access on transit may require operational adjustments of transit operators.

Other Impacts

In addition to improving air quality, TCM 9 will mitigate traffic congestion. Benefits in travel time savings are estimated at \$1.4 million per year. Other impacts include reduced fuel consumption, motor vehicle depreciation and wear and tear, road maintenance costs, and less need for parking at new developments.

Bicycles are also an excellent means of exercise. More and better bike routes are one element of TCM 9. In addition, public education is needed among both bicyclists and motorists to promote safer bicycling.

TCM 10 - YOUTH TRANSPORTATION

Purpose

TCM 10 is designed to reduce motor vehicle travel and mobile source emissions related to the transportation of youths and students.

Background

Youth and students have special transportation needs. Because they have limited access to motor vehicles, they depend upon public transit, bicycles, walking, and parental chauffeur services.

Due to funding constraints, a number of school districts in the Bay Area are no longer able to operate school bus services.

Description

TCM 10 will improve youth/student mobility and reduce vehicle trips by:

- seeking new funding through educational or other funding sources for school districts which may be interested in reinstating school bus service (these services are usually contracted out to private carriers)
- encouraging carpooling among high school students with cars
- establish special carpool formation services for parents, students and staff at Bay Area elementary and secondary schools
- support transit ride discounts to youth and students

TCM 10 will also reduce emissions by encouraging the conversion of school buses to clean fuel vehicles.

Travel Market Affected

According to MTC travel data, school trips account for 2-3% of total vehicle miles traveled in the Bay Area. TCM 10 would address this market, as well as youth travel outside of school hours.

In addition to its direct impact on school trips, TCM 10 may also have an impact on commute trips. If additional school bus service is provided, parents who must now drop off their children at school while in route to work might be able to commute via ridesharing or transit.

Effectiveness

While carpooling activities for parents and students is a Phase 1 activity, all emissions reductions from TCM 10 are expected to come in Phase 2.

<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
0.14%	0.14%	0.16%

Cost

Unknown. If legislation is approved to provide funding, additional youth transportation would be provided.

Implementation

Full implementation is contingent upon approval of funding (see TCM 18).

MTC will allocate funds to transit operators, who, in turn, generally provide discounts to student riders.

BAAQMD and MTC will work with RIDES or another entity and school districts to promote carpooling for high school students with cars and among parents, students and staff at Bay Area elementary and secondary schools. Funding for this activity can be provided by AB 434 funds.

Impediments

Full implementation of this measure depends upon approval of State legislation to provide funding for mobility improvements.

Other Impacts

In addition to reducing emissions, TCM 10 will mitigate traffic congestion. Other benefits include reduced fuel consumption and wear and tear on motor vehicles and roadways, as well as less demand on parents to provide private transportation for their children.

TCM 11 - INSTALL FREEWAY TRAFFIC OPERATIONS SYSTEM (TOS)

Purpose

TCM 11 will reduce congestion-related emissions by improving the flow of traffic on the regional transportation network.

Background

Congestion is a significant cause of motor vehicle emissions. Much of the regional freeway network already operates at or above capacity during peak periods, and congestion is expected to increase substantially in future years, even with planned increases in capacity. Operational improvements are a cost-effective means to improve the efficiency of the regional transportation system.

Description

Caltrans' Traffic Operations System (TOS) includes multiple operational strategies such as ramp metering, traffic surveillance, traffic advisory signs, and incident management to eliminate traffic tie-ups more quickly.

Federal TCM 26 assumed completion of Caltrans' TOS on freeways in the immediate vicinity of the Bay Bridge (Segment 1). Full implementation of the TOS will cover approximately 500 miles of the Bay Area's freeways.

MTC and Caltrans have implemented Freeway Service Patrols on 165 miles of freeways to limit the impacts of vehicle breakdowns on freeway congestion.

Travel Market Affected

TCM 11 will address all categories of vehicle trips, including inter-regional and commercial travel, as well as commute trips, shopping recreation, personal business, etc.

Effectiveness

TCM 11 is expected to yield significant reductions in both emissions and vehicle hours of delay. However, by reducing congestion, this measure is expected to produce a small increase in vehicle trips and VMT.

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>
Phase 1	0.42%	0.35%	0.65%
Phase 2	1.40%	1.10%	1.80%
Total	1.82%	1.45%	2.45%

Cost

Caltrans has funding to complete the Segment 1 and the Conerstone Project. Segment 1 totals 22 miles and the Conerstone Project totals 45 miles. Funding for up to 216 miles is in the *1994 TIP*. Funding requirements for remaining Phase 2 improvements are being refined at this time.

Freeway Service Patrols are funded through a \$1 fee on vehicle registrations, Traffic Management funds for the 680/24 project and State funds through AB 3346.

Implementation

Caltrans is responsible for installing and operating the Traffic Operations System. Funds are programmed in the *1994 TIP* for the Phase 1 (Segment 1 and the Conerstone Project) and other elements.

Segment 1 of TOS has been completed. The Conerstone Project, which consists of I-80, I-580 and I-880 in Alameda County, and I-80, Highway 101 and I-280 in San Francisco, will be operational in 1996. Full implementation of the TOS is expected to be completed in Phase 2.

MTC and the Partnership will develop a Metropolitan Transportation System Management Strategy, which will help define components of the TOS.

Impediments

Implementation of Phase 2 of TOS will require fully defining all components of TOS and their costs. Implementation will be provided for in the *Regional Transportation Plan*.

Other Impacts

In addition to providing significant emission reductions, TCM 11 should substantially reduce traffic congestion and vehicle hours of delay.

It should be noted that although most TCMs cause reduced vehicle trips and vehicle miles traveled, TCM 11 is expected to result in an increase in trips and VMT by reducing delays. If TCM 11 results in increased VMT in the region, there may be increased emissions of NO_x, PM₁₀, and possibly other air and water pollutants.

Installation of freeway ramp meters has the potential to create traffic congestion on local streets adjacent to the ramps. Mitigation measures can be implemented to reduce this impact, including arterial traffic management, as described in TCM 12.

TCM 12 - IMPROVE ARTERIAL TRAFFIC MANAGEMENT

Purpose

By improving the flow of traffic on arterial routes, TCM 12 will reduce running emissions, congestion-related emissions, and vehicle idling.

Background

Arterial routes play a critical role in the regional transportation system. They are used on a very high percentage of vehicle trips, both for short distance trips (shopping, errands, recreation), as well as to provide access to freeways for longer trips. Arterial travel produces relatively high emissions per mile, due to low average speed and frequent stops and starts.

MTC projects that travel on arterial routes will increase substantially over the next twenty years. Measures to improve arterial traffic flow are essential to maintain regional mobility and to avoid an increase in vehicle emissions due to congestion. On congested routes, a relatively small reduction in vehicle traffic yields substantial reduction in traffic congestion.

Arterials also serve key bus routes throughout the region. Improving the flow of buses on arterials can reduce bus travel times and stimulate increased transit patronage.

Description

- **Signal timing.** Establish new signal timing programs (Federal TCM 24) and maintain those programs already in existence (Federal TCM 25).
- **Bus Improvements.** Improve arterials for bus operation through signal preemption, relocation of bus stops, or other means.
- **Bicycle Improvements.** Improve arterials for bicycles by re-striping, bicycle signal detectors and other means.
- **Develop Metropolitan Transportation System Strategy.** MTC will be developing an MST Management Strategy for the Bay Area. Its goal will be to improve the region's mobility through coordinated management of the existing and future transportation system.

Travel Market Affected

TCM 12 will affect the entire range of vehicle trips, including commute travel, school travel, shopping, personal business, recreation, and commercial travel.

Effectiveness

TCM 12 will yield the following estimated reductions in vehicle emissions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.20%	0.25%	0.30%
Phase 2	0.23%	0.27%	0.33%
Total	0.43%	0.52%	0.63%

Note that, by reducing congestion, TCM 12 will (like TCM 11) produce an increase in vehicle trips and VMT.

Cost

The currently programmed cost to implement TCM 12 is estimated at \$25 million over the next five years for signal hardware and minor capital improvements.

Implementation

TCM 12 will span Phases 1 and 2. Implementation of TCM 12 will require cooperation among MTC, Caltrans, cities and counties, Congestion Management Agencies, and transit operators.

- **Signal timing.** Since 1983, approximately 34 Bay Area local agencies have participated in Caltrans' Fuel Efficient Traffic Signal Management (FETSIM) program, which has resulted in the re-timing of more than 1,700 traffic signals. There are up to 3,600 signals that could be timed to optimize traffic flow. MTC has conducted a regional traffic management study which makes recommendations for improvements. In the 1994 TIP, approximately \$25 million is programmed for signal upgrades and signal timing projects.

Successful signal timing efforts also require coordination across local boundaries. MTC sponsored a study to coordinate a multi-jurisdictional signal re-timing project along El Camino Real in five cities in San Mateo County. MTC has also established the Arterial Advisory Committee to assist in developing traffic operational improvements in the Bay Area.

Congestion Management Programs (CMPs) should include arterial traffic management strategies as a key requirement in their transportation demand management elements. Coordination between neighboring jurisdictions on signal timing should be a requirement for receiving subvention funds. MTC will review CMPs to ensure coordination between neighboring cities in the development of arterial traffic management plans and signal timing projects.

- **Bus/bicycle improvements.** Local agencies and transit operators will examine ways to improve the flow of buses and bicycles through signal preemption, relocation of bus stops, re-striping and other means. These efforts are related to the CMP requirement for developing and maintaining service standards.

Impediments

Full implementation of TCM 12, including maintenance and expansion of signal timing programs to additional cities, will require a more reliable source of funding than currently exists especially for ongoing retiming of signals.

Other Impacts

By reducing congestion, TCM 12 is expected to produce travel time savings. TCM 12 will also help to reduce fuel consumption and noise by improving the flow of traffic and reducing vehicle idling, braking and acceleration. By improving the flow of bus traffic, TCM 12 may help to stimulate increased transit ridership.

It should be noted that TCM 12 is expected to result in an increase in vehicle travel; vehicle trips are projected to increase by 0.03% and vehicle miles traveled by 0.02%. If TCM 12 results in increased VMT in the region, there may be increased emissions of NO_x, PM₁₀, and possibly other air and water pollutants. TCMs 11 and 12 are the only TCMs that are thought to increase motor vehicle travel.

TCM 13 - TRANSIT USE INCENTIVES

Purpose

TCM 13 will help to increase transit use and reduce motor vehicle travel by reducing selected fares, expanding the marketing of transit tickets and passes, and improving coordination of service among transit systems.

Background

To shift auto trips to transit, transit must be competitive with the private automobile in terms of cost, travel time and convenience. There are currently 17 major transit operators in the nine county Bay Area. While this structure provides good local service in many areas, it complicates the use of transit for travel around the region.

Although transit already plays a key role in peak period commute travel, it is under-utilized for non-commute trips such as shopping and recreation. Special reduced fares will be targeted toward increasing transit ridership for non-commute purposes during off-peak periods and weekends when there is considerable excess capacity.

In addition to stimulating transit use, reductions in transit fares will help to address "equity" concerns related to revenue-generating and pricing measures (TCMs 18 and 19).

Description

- Proposals for fare reduction include:
 - fares reduced in the off-peak;
 - exploration of special transit fares targeted at smaller groups of riders, such as group/family discount fares for weekend travel, a "tourist" fare for visitors to the Bay Area, or a downtown fare for transit use within a defined area.
- Measures to expand distribution of transit tickets and passes include:
 - expand the Regional Transit Connection (RTC) ticket distribution program which provides for on-site sale of transit tickets at participating employers (Federal TCM 22);
 - a "Commuter Check" program for employers who wish to directly subsidize purchase of employee transit tickets (Federal TCM 22);
 - set up local transportation stores, for drop-in purchases of tickets and other kinds of transportation assistance (modeled after the Berkeley TRIP program).

- Improve coordination of schedules, fares and transfers among transit operators (Federal TCM 21).
- Construct transit centers in Alameda and Contra Costa County
- Implement a universal transit ticket (Translink) on Bay Area transit systems
- Establish a regional toll-free transit information number.

Travel Market Affected

TCM 13 will make transit a more attractive option for a wide range of trips. Measures to promote the sale and subsidy of transit passes through employers (the RTC and "Commuter Check" programs) focus on commute travel. Measures to reduce off-peak fares focus on increasing use of transit for non-work travel (shopping, recreation, etc.).

Effectiveness

TCM 13 is expected to provide the following emission reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 1	0.11%	0.11%	0.09%
Phase 2	0.11%	0.11%	0.09%
Total	0.22%	0.22%	0.18%

Cost

MTC's *Regional Transportation Plan* shows \$29 million for the Translink program over the next 20 years. The Regional Transit Telephone information service will cost \$800,000 to implement and will include automated route planning. Approximately \$60 million is projected for the various transit centers in Alameda and Contra Costa Counties.

Estimates do not include the cost to improve schedule and fare coordination among transit operators, since these activities are mandated by SB 602. Potential expenditure by employers who choose to participate in the "Commuter Check" program has not been estimated. However, since employers receive state and federal tax benefits for providing transit subsidies to their employees, the actual cost to employers will be less than the value of vouchers provided to their employees.

Implementation

TCM 13 spans both Phase 1 and Phase 2. Phase 1 elements include integration of transit service (Federal TCM 21 in response to AB 602), expansion of the RTC program, implementation of the "Commuter Check" program, transit centers, universal ticket and toll free transit information.

Implementation of fare and schedule coordination (AB 602) is already well underway, based on guidelines in MTC Resolution 2137. MTC is working with the region's transit operators via the Regional Coordination Task Force. At least a dozen new joint passes and transfer arrangements have already been developed in the region, such as the "BART Plus" pass. MTC has also implemented Translink on CCCTA and BART buses. The ultimate goal is a universal ticket for use on all transit systems in the region.

MTC manages the Regional Transit Connection (RTC) program to distribute transit tickets at employment sites. Transit operators underwrite the program. The program expanded from 141 participating companies in January 1990 to 170 as of January 1994 with nearly \$13 million in tickets and passes sold in FY 1992-93.

MTC introduced the new "Commuter Check" program in September 1991. The program provides an easy means for employers to subsidize transit passes for their employees. MTC, RIDES and transit operators are promoting the service to employers and commuters. Commuter Check, Inc. administers the program.

Phase 2 measures in TCM 13 include additional subsidies for feeder bus service to mass transit lines, fare reductions for target groups, and "commute stores." Full implementation of Phase 2 elements requires approval of legislation to provide additional revenues (see TCM 18).

Impediments

The principle obstacle to full implementation of TCM 13 is the need to obtain additional funding sources for the Phase 2 measures.

Other Impacts

In addition to reducing emissions, TCM 13 will help to reduce traffic congestion and fuel consumption. This measure should also increase transit patronage, provide more convenient service for transit users, and promote increased mobility for riders who are sensitive to fare levels. TCM 13 will be of particular benefit to the transit dependent population in the region.

By reducing motor vehicle use, TCM 13 will result in reduced vehicle wear and tear and depreciation, reduced costs for roadway maintenance, and reduced need for parking at employers and other sites in the region.

TCM 14 - IMPROVE RIDESHARE/VANPOOL SERVICES, MARKETING AND INCENTIVES

Purpose

TCM 14 is intended to reduce motor vehicle trips and VMT by enhancing rideshare marketing and services and by providing user incentives for carpools and vanpools including reducing the cost of acquiring vehicles.

Background

A major cause of the Bay Area's traffic congestion and vehicle emissions problems is the inefficient use of the transportation system and the single occupant vehicle; especially during commute periods, when approximately 68% of commute trips are single occupant vehicles.

Ridesharing represents a cost-effective means to increase vehicle occupancy, thus reducing vehicle trips, VMT, congestion, and vehicle emissions. Increased ridesharing is also essential to help the Bay Area achieve a regional 1.4 average vehicle ridership (AVR) during peak commute periods by 1999, as required by the California Clean Air Act.

Cost, time and convenience are the prime factors that determine individual choice of travel mode. HOV lanes (TCM 8), preferential parking, guaranteed ride home programs and other similar strategies can help to offset the advantage that solo driving generally offers in terms of time and convenience. Convenience is also enhanced by ridesharing services such as carpool/vanpool ridematching and personalized trip planning. Ridesharing user incentives such as parking cash-out programs, Commuter Check vouchers (vanpools only), and "trial-offer" promotions for new carpools/vanpoolers are designed to increase the cost advantage of ridesharing compared to solo driving.

Description

TCM 14 includes several elements to improve ridesharing services, marketing and incentives.

- RIDES or another entity will develop joint efforts with the private sector to improve access to the regional ridematching system by using new technologies to make ridematching and personalized trip planning information directly available to commuters and employers.
- Caltrans, BAAQMD, ridesharing agencies, local governments and other entities will conduct regional and local marketing activities designed to promote ridesharing.
- Caltrans and other agencies will fund programs to provide user incentives to carpools and vanpoolers.

- Employers will be encouraged to satisfy their responsibilities under the employer-based trip reduction rule (TCM 2) by providing subsidies and incentives for ridesharing and transit.
- RIDES or another entity will study publicly operated or financed vanpool vehicle acquisition programs. Phase 2 could include implementation of such a program, pending results of the study.

Travel Market Affected

TCM 14 focuses on commute travel. The expansion of the RIDES regional ridematching system could be used to provide services to non-commute work trips such as home-to-school trips, trips to airports and other major traffic generators.

Effectiveness

The following emission reductions are expected for TCM 14:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 2	0.02%	0.02%	0.01%

Cost

Costs for the expansion and enhancement of RIDES regional ridematching system would depend upon the type of products and services developed. For example, stand-alone ridematching kiosks would cost \$10,000-\$15,000, while real-time ridematching for commuters via personal computers and modems would be considerably more expensive.

Caltrans current regional marketing program costs more than \$2,000,000 for three years. Smaller, but still significant amounts are being spent for marketing as part of Caltrans corridor construction projects.

Recent Caltrans-funded incentive programs have provided \$20-\$30 "trial offer" incentives to thousands of commuters for ridesharing and transit. Vanpool subsidies frequently involve 3-month partial payments to new vanpool riders totaling up to \$100.

Employers which provide cash incentives for employees who rideshare would experience additional expenses, depending upon the level of subsidy and the scope of the program. Some incentives qualify businesses for California state tax credits and deductions. Such expenses could be reduced or eliminated if combined with parking charges for solo commuters.

Cost to study public acquisition and operation of vanpools would be approximately \$50,000. Cost of such a program would depend upon the scope and level of subsidy.

Implementation

MTC, Caltrans, BAAQMD and the private sector would fund the development of new products and services to enhance the regional ridematching system.

Caltrans and other agencies will continue to fund and direct regional/local marketing programs for ridesharing, transit and other commute options.

User incentives will be funded by Caltrans and other agencies for corridor marketing campaigns and other programs.

Employers will expand their use of employee incentive programs as they develop trip reduction programs to meet the requirements of the employer-based trip reduction rule (TCM 2).

Subject to funding, RIDES or another entity could study implementing a publicly operated or financed vanpool vehicle acquisition program.

Impediments

The primary impediment is securing funding for the above programs.

Other Impacts

In addition to reducing emissions, TCM 14 will reduce traffic congestion and fuel consumption. This measure will also reduce wear and tear and depreciation on motor vehicles, and reduce maintenance costs for the region's roadway system. TCM 14 will also help to ensure the use of the HOV lane network that is described in TCM 8.

TCM 15 - LOCAL CLEAN AIR PLANS, POLICIES and PROGRAMS

Purpose

TCM 15 encourages cities and counties to address the air quality impacts of local activities by adopting and implementing air quality-beneficial plans, policies and programs. Land use patterns directly affect travel behavior. Motor vehicles are a major source of carbon monoxide, fine particulates, ground-level ozone precursors and other air contaminants. TCM 15 also would reduce motor vehicle use and increase transit ridership by encouraging local governments and transit agencies to cooperate in planning and promoting high density, mixed use developments at transit centers and along transit corridors. Transit oriented development would be encouraged at multi-modal stations; rail, bus and ferry transit centers; and along rail and bus line corridors.

Background

The Air District adopted Resolution 1666 in May 1986 urging local governments to address the air quality impacts of all local activities by incorporating air quality elements into their general plans. To date, approximately 35 cities and counties have complied.

The California Clean Air Act (CCAA) requires regional clean air plans to include indirect source control programs to encourage developments, as well as local and regional plans, which:

- minimize dependence on motor vehicles and, thereby, reduce air contaminant emissions;
- require mitigation of adverse air quality impacts of facilities which do attract a significant volume of motor vehicle traffic.

TCM 15 responds to Resolution 1666 and the indirect source requirements of the CCAA. This measure encourages cities and counties to address the indirect source control requirements of the CCAA.

Description

Cities and counties can integrate air quality-beneficial policies and programs into general plans and related implementation programs such as subdivision regulations, zoning ordinances, capital improvement programs, and development design guidelines. Localities can produce separate air quality elements, or can incorporate air-quality beneficial policies into the land use, circulation/transportation, and other required elements of the existing general plan. In using either approach, jurisdictions should promote consistency among general plan elements, between the general plan and related implementation measures, and between local, regional, state and national policies and programs.

Reducing air pollution related to the use of motor vehicles is the primary goal. Implementation strategies include encouraging compact community land use patterns, zoning for higher densities and mixed uses near transit centers and corridors, increasing the supply of housing near

employment, restricting parking in downtowns and at job centers, improving transit service, and adopting community, neighborhood and site design standards that provide safe, convenient and attractive environments for pedestrians, bicyclists and transit users.

Travel Market Affected

Local planning and decision making to improve air quality and reduce motor vehicle travel will address all types of trips—commute, shopping, school, recreation, social, and personal business.

Effectiveness

This TCM would reduce emissions over the long term by promoting better integration of land use and transportation at the local level and by supporting the implementation of the other TCMs in the Clean Air Plan. The following are the estimated emission reductions in Phase 2:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Phase 2	0.05%	0.05%	0.05%

Cost

TCM 15 has an estimated regionwide cost of \$3 - \$3.5 million. This estimate assumes an average cost of approximately \$50,000 to each of the Bay Area's 9 counties and between \$5,000 and \$50,000 to each of the 100 cities in the region. Annual cost to prepare station area plans for transit stations is estimated at \$500,000.

Implementation

The Association of Bay Area Governments (ABAG) and the Air District have developed a guidebook for cities and counties entitled *Improving Air Quality Through Local Plans and Programs* (Guidebook), and a series of appendices that contain the background information local jurisdictions will need to evaluate air quality problems and identify policies and implementation strategies appropriate to their individual circumstances. Copies will be distributed to local planners and decision makers at a series of subregional workshops during Fall 1994.

The Air District will consult with and provide technical assistance to local jurisdictions seeking to develop local clean air plans, policies and programs.

ABAG, MTC and the Air District will explore ways to provide incentives to jurisdictions that implement the air quality-beneficial policies and programs outlined in the Guidebook.

Local government is encouraged to require the provision of bicycle access and facilities (e.g., secure parking and showers/lockers, where appropriate) at developments such as office parks, shopping centers, and residential complexes (see TCM 9). Access and facilities should be incorporated directly into site design for new development.

ABAG will encourage integration of air quality-beneficial policies and implementation strategies in subregional plans through outreach to bodies such as CMAs and countywide planning agencies.

The Air District will update its guidelines for local jurisdictions regarding air quality analysis of projects and plans.

The Air District will research travel behavior and trip reduction strategies for major indirect sources such as airports, shopping centers, schools and large activity centers (e.g. stadiums and arenas). These facilities are large sources of indirect source emissions and, in some cases (e.g. airports and schools), are not subject to the full range of local land use controls.

This research will serve two purposes:

- 1) Aid the Air District in assisting local officials in minimizing emissions from these facilities, and
- 2) Provide a foundation for the possible development of District regulations(s) for major indirect sources in the 1998-2000 planning period, should further emission reductions from these sources be necessary.

MTC will encourage STP/CMAQ funded projects that support higher density development around transit centers and along transit corridors through its multimodal scoring process.

MTC will assess the impact of a transit-oriented development pattern for the Bay Area as part of its *Regional Transportation Plan* update.

Impediments

The major impediment to full implementation of TCM 15 will be funding and staff time for local governments to prepare and implement local clean air plans, policies, and programs.

Other impediments include securing additional funding to complete MTC's New Rail Starts program, and the need to develop creative design solutions to address and resolve concerns about increased density and auto traffic in the vicinity of transit stations.

Other Impacts

The air quality-beneficial policies and programs recommended in the Guidebook can help cities and counties achieve the following benefits:

- improve housing supply and affordability
- reduce traffic congestion
- increase mobility
- conserve energy
- improve water quality

-
- preserve open space, agriculture and other land resources
 - use infrastructure and land more efficiently
 - reduce roadway construction and maintenance costs
 - increase transit ridership
 - improve economic competitiveness

Air quality-beneficial plans, policies and programs generally can be expected to have a positive effect on local quality of life and local government finance.

TCM 16 - INTERMITTENT CONTROL MEASURE / PUBLIC EDUCATION

Purpose

The purpose of this measure is to educate the public about air quality in the Bay Area and encourage residents to make choices that have a positive effect on air quality, particularly regarding transportation and consumer activities. Special emphasis is placed on the need to curtail polluting activities on days when air quality is poor so that emissions can be reduced and violations of federal and state air quality standards can be avoided. This element of the program is called *Spare the Air*. It began in 1991 and is continuing.

Background

Since motor vehicles are the leading source of air pollution in the Bay Area, meeting state air quality standards will require the support of the motoring public. The success of the Clean Air Plan will depend to a significant extent on the voluntary cooperation of individuals. Research on public attitudes about air quality conducted in the Bay Area in 1990 indicates that the public is committed to clean air and is willing to help achieve the goal if given rational choices and options.

Description

Spare the Air is an intermittent, voluntary control program. It focuses on the 15 to 25 days per year when air quality is poor and approaching the unhealthful level. On these days, the District issues *Spare the Air* requests and asks Bay Area residents to curtail or postpone consumer activities that pollute. This includes eliminating unnecessary driving by biking, walking, telecommuting, taking public transit or carpooling instead. It also includes linking motor vehicle trips together ("trip-linking") to avoid polluting cold starts. Residents are also asked to avoid consumer activities that generate pollution such as the use of aerosol spray products, small gasoline engines, household painting projects that use oil-based paints, and the use of recreational boats. Together these activities generate almost 250 tons per day of organic gases in the Bay Area.

Spare the Air days are declared when any part of the Bay Area is predicted to have 83 or greater on the Pollutant Standards Index (PSI) scale - above the state standard for ozone (75 PSI). Predictions are made the previous afternoon by District meteorologists.

In 1992, the District added a new element to the program called *Employer Spare the Air*. Employers who joined the program pledged to educate their employees on air quality and *Spare the Air*, and to notify employees of *Spare the Air* days. The District makes numerous educational materials available to the employers including brochures, a video, posters, signs, sample newsletter articles, and training sessions. Approximately 400 employers (400,000 employees) now participate.

The value of intermittent controls to reduce pollution has been reinforced by the District's employer-based trip reduction rule (Regulation 13) which suggests *Spare the Air* as a program

element in overall employer commute programs. Employer support of the program has been strong.

Topics addressed in the public outreach effort of this TCM include:

- the health effects of air pollution,
- the benefits of leaving a single-occupant motor vehicle at home on poor air quality days,
- the benefits to the environment of carpooling, vanpooling, taking public transit, biking, walking, or telecommuting to work,
- the air pollution effects of motor vehicles that are not properly tuned,
- the benefits of trip-linking,
- the air quality advantages of using consumer products in non-aerosol forms and electric or hand-powered lawn mowers and leaf blowers.

Market Affected

The intermittent control program is aimed at the general public with special emphasis on motorists. However, a strong component is the idea that everyone can do something to help the environment even if they do not drive or can not curtail motor vehicle use.

Effectiveness

No emission reductions have been directly attributed to the voluntary program. However, there are plans to do a follow up public information survey to assess the effectiveness of the program. The campaign should contribute to reduced emissions by enhancing public support for the use of transit, ridesharing, bicycles and other transportation alternatives, as well as the reduced use of aerosol products and other consumer activities that pollute.

Cost

The annual cost of the program is approximately \$300,000 which includes staff time, consultant time, the printing and distribution of materials, and radio advertising.

Implementation

The *Spare the Air* program, along with other aspects of the Air District's public outreach efforts, receives input from the District's Public Outreach Steering Committee, which is composed of representatives from the business community, labor, local government, civic and environmental groups. The Committee has helped develop and implement the program, and meets regularly to assess progress and next steps. The District has also formed grass-roots resource teams in every Bay Area county and region-wide resource teams for large employers and media and education representatives all of whom help implement and give feedback to the campaign.

Other Impacts

This measure raises the awareness of the public about the causes of and solutions to the air pollution problem. Although the TCM addresses intermittent controls, it may have a broader impact. People who choose to change their travel or other behaviors in response to a voluntary request may continue to reduce vehicle use or change the type of consumer products they use on a regular basis.

The idea of intermittent controls can also be transferred to wintertime when carbon monoxide and particulate levels can be elevated. The District's wintertime intermittent control program, *Don't Light Tonight*, is aimed at curtailing woodburning when air quality is poor. This program benefits from the awareness generated by the summertime program.

TCM 17 - CONDUCT DEMONSTRATION PROJECTS

Purpose

This measure will promote demonstration projects to encourage innovative approaches to reduce motor vehicle travel and mobile source emissions.

Background

Additional work remains to be done in terms of testing new approaches and monitoring their effectiveness, quantifying emission reductions and travel benefits, and evaluating the synergistic effects of complementary measures. It is important to encourage demonstration projects which can serve as models for trip reduction and travel demand efforts and clean fuels/vehicles throughout the region.

Description

This measure would undertake various demonstration projects and studies to further develop strategies that will ultimately be required to help achieve State air quality standards. Examples are as follows:

- Telecommuting

To evaluate opportunities and constraints associated with home-based telecommuting, this measure will consist of demonstration projects involving partnerships with the business community. Some key issues include:

- employer willingness to permit telecommuting
 - percentage of employees whose work is amenable to telecommuting options
 - percentage of employees who would choose to telecommute on a long-term basis
- Electronic Toll Collection
 - Alternative fuel carpools with interested employers

Travel Market Affected

The proposed demonstration projects would directly effect only a very small percentage of travel in the region. However, the experience gained through these projects will be of great benefit in developing policies and programs that affect all types of travel in the region, including commuting, shopping, recreation and personal business, and commercial travel.

Effectiveness

Because the success of demonstration projects are unknown, no direct emission reductions are claimed. However, demonstration projects should contribute to reduced emissions by providing tested models to use in crafting effective programs on a local or region-wide basis.

Cost

Unknown. Depends on the project.

Implementation

The Air District and MTC will cooperate with employers and public agencies such as Caltrans and FHWA in developing demonstration projects.

- MTC received a Federal Transit Administration (FTA) grant to establish telecommuting centers. MTC has worked with a consortium of public/private agencies to establish two centers. This demonstration has indicated that there is not strong support among employers for telecommuting *centers*. However, this same consortium will be exploring opportunities in *home-based* telecommuting, and provide referrals for companies and individuals pursuing telecommuting opportunities.
- Additional projects will be developed to assess the use of electronic systems for toll collection and for congestion pricing of roadways (See TCM 19).
- Additional projects will be developed to promote use of alternate fuel vehicles (see control measure M4 in Appendix G).
- Caltrans will fund the installation of electronic toll collection equipment on State bridges. Initially, installation will take place on the Carquinez Bridge by mid-1995 followed by installation on the Benicia-Martinez, Richmond and San Francisco-Oakland bridges by the end of 1995.
- Other demonstration projects may be developed if funding is available.

Impediments

The Air District and MTC will need to secure additional revenue to assure full implementation of TCM 17. If legislation to fund the mobility package is approved (see TCM 18), a portion of this funding could be allocated to demonstration projects. AB 434 funds may be available for demonstration projects. Some funding for demonstration projects may also be forthcoming from State and Federal agencies and from the private sector. Caltrans is funding the electronic toll collection project.

Other Impacts

The demonstration projects in TCM 17 could have considerable impacts beyond air quality, if implemented on a widespread basis. Telecommuting has the potential to bring about a major change in work culture, productivity, lifestyle, travel patterns, etc.

TCM 18 - IMPLEMENT REVENUE MEASURES

Purpose

TCM 18 is designed to secure additional revenue needed to fully fund the mobility improvement measures in the TCM plan.

Background

We cannot expect people to significantly reduce auto travel unless they have access to viable alternatives in the form of improved and expanded transit service, high occupancy vehicle lanes, vanpools, and bicycle and pedestrian facilities. The TCM plan therefore contains a set of measures, collectively referred to as the "mobility package," to improve options to the single occupant automobile. Although partial funding is currently available for most projects, MTC estimates that additional revenues of \$150 to 200 million per year are needed to fully fund the regional transportation program identified in the *Regional Transportation Plan*.

Description

The preferred revenue sources for the mobility package are increases in bridge tolls, motor vehicle registration fees and gas taxes.

- Three revenue measures have been approved and implemented. These are Federal TCM 13 (Increase bridge tolls to \$1.00 on all bridges), Federal TCM 15 (Increase state gas tax by \$.09 per gallon) and AB 434 (increase in registration fees). The bridge toll increase generates annual revenues of \$38 million for capital investment on new rail projects, as well as congestion relief projects such as ferry and bicycle improvements. AB 434 increases motor vehicle registration fees by up to \$4 per vehicle. This measure generates approximately \$16 million per year.
- One element of the revenue package calls for an increase in the gas tax by \$.10 per gallon or an equivalent revenue-generating measure. This measure is critical, as it would provide an estimated \$200 million per year--the bulk of the revenue needed to fund the mobility improvements.
- Currently, CMAQ funds are only available to regions which are in non-attainment of Federal air quality standards. Since the Bay Area has requested redesignation as an attainment area, we are at risk of losing this funding source. Continuation of CMAQ funds would help the region maintain its attainment status.

Travel Market Affected

TCM 20 will affect all types of travel, including commuting, shopping, recreation and personal business, and commercial travel.

Effectiveness

The primary purpose of TCM 18 is to generate revenue to fund the mobility package. However, by increasing the cost of driving, TCM 18 will cause a reduction in vehicle trips and miles driven and in vehicular emissions. Anticipated emission reduction are as follows:

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>
Phase 2	0.30%	0.32%	0.30%
Total	0.30%	0.32%	0.30%

Cost

Revenue measures to fund the mobility package are projected to raise approximately \$225 million per year.

Implementation

MTC and the Air District will cooperate to secure approval of revenue measures in future legislative sessions. Support from the business community and environmental groups will be needed.

Impediments

Approval of legislation to authorize a regional gas tax increase of \$.10 per gallon will be difficult. Without approval of this measure (or an equivalent revenue-generating measure), full implementation of the mobility improvement package will be compromised.

Other Impacts

TCM 18 has a dual effect; it generates revenue to fund the mobility package and it reduces emissions by raising the cost of driving. By reducing vehicle trips and vehicle miles traveled, TCM 18 will have an impact in terms of reducing traffic congestion, fuel consumption, motor vehicle depreciation and wear and tear on the region's roadway network.

TCM 19 - IMPLEMENT MARKET-BASED PRICING MEASURES

Purpose

TCM 19 is intended to reduce motor vehicle emissions and traffic congestion through a combination of pricing measures, including "smog-based" vehicle registration fees, higher gas taxes, and "congestion pricing."

Background

There is growing acknowledgment that solutions to air quality and traffic congestion problems depend upon basic changes in the way that transportation is funded and priced in the United States. The costs of owning and operating an automobile are much lower in the United States than in any other developed nation. The low cost of driving and the substantial public investment in roads and highways combine to stimulate motor vehicle travel, while discouraging the use of alternative modes such as transit. Large growth in vehicle ownership and vehicle miles traveled (VMT) over the past several decades has impeded attainment of State air quality standards and led to increasingly severe traffic congestion in the Bay Area.

Over the past several years, support has grown for measures to increase the cost of driving and to implement "congestion pricing" as a means to better distribute travel in terms of time and route. This support spans a diverse range of interests, including business and environmental groups. Advocates of pricing measures point out that these measures effect the full spectrum of vehicle users and trip purposes.

The cost of driving includes both ownership costs (purchase, interest, insurance and registration) and operating costs (fuel, tolls, parking, etc.). Ownership costs are "fixed" costs, while operating costs are "variable." Automobile owners are primarily influenced by variable operating costs in making daily travel decisions. Therefore, increases in variable costs are most effective in reducing motor vehicle use.

Although pricing measures offer strong potential for reducing air pollution and congestion, these measures must be implemented in conjunction with policies to ensure that pricing measures do not place an undue burden on low income households.

Description

The Air District and MTC will cooperate in developing legislative strategies needed to implement pricing measures. The specific details of the pricing measures will be determined through the process of drafting and securing approval of the legislation.

TCM 19 actually consists of four pricing strategies. The assumptions used for modeling purposes and descriptions are below:

Smog-based Vehicle Registration Fees. Vehicle registration fees would be based on the calculated annual emissions from each vehicle, derived from the odometer reading and a

representative measurement of tailpipe emissions. Fees would range from \$20 per year to over \$1000 per year, depending on the vehicle and its pattern of use. Total revenue from smog fees would be approximately \$500 million per year, an average of about \$125 per vehicle.

Expand Congestion Pricing. MTC, FHWA and Caltrans are now engaged in a study of congestion pricing on the Oakland-San Francisco Bay Bridge. The results of the study are intended to determine if a particular congestion pricing strategy is appropriate for this bridge. If the study supports congestion pricing and the legislature authorizes it, MTC and Caltrans will begin a demonstration of congestion pricing on the bridge. If this demonstration is successful, congestion pricing may be expanded to other bridges in the region.

Gas Tax Increase of \$2 per Gallon. Over a ten year period, gas taxes could be gradually increased by a total of \$2 per gallon. This would bring those taxes to a level consistent with other developed countries (Western Europe, Japan). At full implementation, this measure would generate revenues of approximately \$1.8 billion per year, or about \$450 per vehicle.

Expand Parking Cash-Out Program. AB 2109 was passed into law in 1992 to require employers who lease parking and meet other specified criteria to offer employees cash in an amount equal to the subsidy for an employees parking space. Expansion of this program could include changes in Federal tax law to allow employers to offer income as an option to currently qualified tax-exempt parking.

Each of the measures would have an impact on reducing motor vehicle emissions. However, they would achieve this effect in different ways. While the gas tax increase would operate by reducing vehicle trips and VMT, congestion pricing would operate primarily by shifting trips temporally and spatially so as to reduce congestion-related emissions. The smog-based vehicle registration fees would operate by encouraging drivers to trade high-emitting vehicles for cleaner ones. Both the congestion pricing and the smog-based registration fees would therefore reduce vehicular emissions much more than they would reduce vehicle trips and VMT .

Travel Market Affected

Market-based measures would effect all types of travel, including commuting, commercial trips, shopping, personal business, and social and recreational travel.

Intra-regional travel would probably be more impacted than inter-regional travel, since vehicles passing through the Bay Area would escape many of the pricing measures, such as "smog-based" registration fees and increased gas taxes.

Effectiveness

Based on these assumptions, TCM 19 would produce the following emissions reductions:

	<u>ROG</u>	<u>NO_x</u>	<u>CO</u>
Smog-based Fee	4.5%	1.2%	4.5%
Congest. Pricing	(a)	(a)	(a)
Gas Tax	7.8%	7.8%	7.6%
Parking Cash-out	<u>(a)</u>	<u>(a)</u>	<u>(a)</u>
Combined	12.3%	9.0%	12.1

(a) These programs are yet to be fully defined so no emission credit is assumed.

These estimates are based solely on the impact of pricing measures as a disincentive to driving. If most of the revenues generated by market-based measures are allocated to improve transit and to fund user incentives for transportation alternatives, TCM 19 will have a greater impact on emissions than shown above.

Cost

The pricing measures would generate revenues of approximately \$2.3 billion per year. Pricing measures would obviously entail substantial out-of-pocket expenses for many drivers, especially those who are either unable or unwilling to shift to alternatives to the single occupant vehicle. However, most of these expenses represent transfers within the region's economy that could benefit the transportation disadvantaged (e.g., low income persons without access to a vehicle, children, the elderly).

Implementation

The Air District, MTC and other local and state transportation agencies will continue to refine the concepts for the above pricing measures in Phase 1. Implementation would occur sometime beyond 1997 (Phase 2). Refinement of the package would provide details regarding the following elements:

- Low fees would be set initially. Fees would increase as transportation alternatives become more available.
- Revenue from the pricing measures would be used to fund transportation alternatives in the Bay Area that yield the greatest air quality benefits.
- Revenue from the pricing measures would also be used to establish a specific fund and/or programs to address economic impacts on low income households. Examples include subsidized transit passes, improved transit service, and income tax credits.

Bay Area business associations and environmental organizations have expressed support for pricing measures. Their support will be needed to secure legislation authorizing pricing measures.

Public education will be necessary to promote understanding and acceptance of pricing measures as a primary solution to the region's air quality and congestion problems.

Impediments

Opposition to measures that would substantially increase the cost of owning and operating a motor vehicle are likely to be the greatest obstacle to implementation of TCM 19. A major increase in gas taxes and implementation of congestion pricing of roadways may prove to be particularly controversial.

Measures to mitigate the impact of pricing measures on low income groups will be essential. It will also be important to educate the public and decision-makers about the considerable inequities in the current system of transportation financing in order to build support for an alternative financing system based on the proposed pricing measures.

Other Impacts

In addition to substantially reducing vehicular emissions, TCM 19 would reduce vehicle trips, vehicle miles traveled, and traffic congestion.

The reduction in traffic congestion would be greater than the reduction in vehicle trips, because congestion pricing measures would serve to better distribute traffic. It should be noted that, under congested conditions, removal of relatively few vehicles from the road yields a significant reduction in congestion.

The above estimates are based solely on the effect of market-based measures as a disincentive to driving. If the revenues generated by pricing measures is used to improve and expand transit and other alternatives to solo driving, this would produce even greater reductions in vehicle travel and emissions.

TCM 19 would also have an impact on fuel consumption, primarily due to large increase in gas taxes, which would induce manufacturers and consumers to shift toward more fuel-efficient vehicles.

TCM 19 would produce other beneficial effects, including:

- reduced vehicular depreciation and wear and tear
- reduced maintenance costs on the regional roadway network
- reduced demand for new and expanded roads and highways
- decreased water pollution from motor vehicles
- reduced emissions of pollutants that are not specifically addressed in the Clean Air Plan, including toxics, particulates (PM₁₀) and global warming gases.

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